CLAIMS

What is claimed is:

1. A method of treating or preventing the effects of radiation in a mammal exposed to radiation, said method comprising administering to said mammal a therapeutically effective amount of an isoflavone.

2. The method of claim 1 wherein said radiation is selected from the group consisting of an acute lethal dose of ionizing radiation, an acute sub-lethal dose of ionizing radiation, a chronic low-dose of ionizing radiation, an acute lethal dose of non-ionizing radiation, an acute sub-lethal dose of non-ionizing radiation, and a chronic low-dose of non-ionizing radiation.

3. The method of claim 2 wherein said radiation is selected from the group consisting of diagnostic X-rays, radiation therapy in cancer treatment, CAT-scans, mammograms, radionuclide scans, interventional radiological procedures under CT or fluoroscopy guidance, tissue-incorporated radionuclides from ingestion of contaminated food or water, and uncontrolled exposure to ionizing radiation from nuclear weapons, radioactive spills, and/or cosmic radiation.

4. The method of claim 1 wherein said isoflavone is selected from the group consisting of genistein, genistin, daidzein, daidzin, glycitein, glycitin, biochannin A, formononetin, O-desmethylangolensin, and equol, their glucosides and derivatives, and mixtures thereof.

5. The method of claim 1 wherein said isoflavone is administered orally, subcutaneously, intramuscularly, intravenously, transdermally, intranasally, or rectally.

6. The method of claim 5 where said isoflavone is administered orally in the form of a capsule, a tablet, an inhaler, a troche, or a food supplement in the form of a food or beverage.

7. The method of claim 1 wherein said isoflavone is administered chronically.

8. The method of claim 1 wherein said isoflavone is administered within 2 weeks prior to exposure to radiation, during radiation exposure, and/or within 2 weeks following radiation exposure.

9. The method of claim 8 wherein said isoflavone is administered within 4 days prior to radiation exposure, during radiation exposure, and/or within 4 days following radiation exposure.

10. A method of treating or preventing damage to living cells, tissues and organs caused by exposure to radiation, said method comprising administering to a therapeutically effective amount of an isoflavone.

11. The method of claim 10 wherein said radiation is selected from the group consisting of an acute lethal dose of ionizing radiation, an acute sub-lethal dose of ionizing radiation, a chronic low-dose of ionizing radiation, an acute lethal dose of non-ionizing radiation, an acute sub-lethal dose of non-ionizing radiation, and a chronic low-dose of non-ionizing radiation.

12. The method of claim 11 wherein said radiation is selected from the group consisting of diagnostic X-rays, radiation therapy in cancer treatment, CAT-scans, mammograms, radionuclide scans, interventional radiological procedures under CT or fluoroscopy guidance, tissue-incorporated radionuclides from ingestion of contaminated food or water, and uncontrolled exposure to ionizing radiation from nuclear weapons, radioactive spills, and/or cosmic radiation.

13. The method of claim 10 wherein said isoflavone is selected from the group consisting of genistein, genistin, daidzein, daidzin, glycitein, glycitin, biochannin A, formononetin, O-desmethylangolensin, and equol, their glucosides and derivatives, and mixtures thereof.

14. The method of claim 10 wherein said isoflavone is administered chronically.

15. The method of claim 10 wherein said isoflavone is administered within 2 weeks prior to exposure to radiation, during radiation exposure, and/or within 2 weeks following radiation exposure.

16. The method of claim 15 wherein said isoflavone is administered within 4 days prior to radiation exposure, during radiation exposure, and/or within 4 days following radiation exposure.

17. A method of protecting personnel exposed to radioactive substances, said method comprising administering to said personnel a therapeutically effective amount of an isoflavone.

18. The method of claim 17 wherein said radiation is selected from the group consisting of an acute lethal dose of ionizing radiation, an acute sub-lethal dose of ionizing radiation, a chronic low-dose of ionizing radiation, an acute lethal dose of non-ionizing radiation, an acute sub-lethal dose of non-ionizing radiation, and a chronic low-dose of non-ionizing radiation.

19. The method of claim 18 wherein said radiation is selected from the group consisting of diagnostic X-rays, radiation therapy in cancer treatment, CAT-scans, mammograms, radionuclide scans, interventional radiological procedures under CT or fluoroscopy guidance, tissue-incorporated radionuclides from ingestion of contaminated food or water, and uncontrolled exposure to ionizing radiation from nuclear weapons, radioactive spills, and/or cosmic radiation.

20. The method of claim 17 wherein said isoflavone is selected from the group consisting of genistein, genistin, daidzein, daidzin, glycitein, glycitin, biochannin A, formononetin, O-desmethylangolensin, and equol, their glucosides and derivatives, and mixtures thereof.

21. The method of claim 17 wherein said isoflavone is administered orally, subcutaneously, intramuscularly, intravenously, transdermally, intranasally, or rectally.

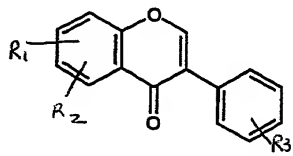
22. The method of claim 21 where said isoflavone is administered orally in the form of a capsule, a tablet, an inhaler, a troche, or a food supplement in the form of a food or beverage.

23. The method of claim 17 wherein said isoflavone is administered chronically.

24. The method of claim 17 wherein said isoflavone is administered within 2 weeks prior to exposure to radiation, during radiation exposure, and/or within 2 weeks following radiation exposure.

25. The method of claim 24 wherein said isoflavone is administered within 4 days prior to radiation exposure, during radiation exposure, and/or within 4 days following radiation exposure.

26. A method for increasing survivability of mammals from a lethal dose of radiation, said method comprising administering to said mammal before, during and/or after said lethal dose of radiation a therapeutically effective amount of a compound of the formula:



wherein R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen, hydroxyl and alkoxy.

27. The method for increasing survivability of mammals from a lethal dose of radiation as defined in claim 26 wherein said compound is genistein.

28. A method for increasing survivability of mammals from a lethal dose of radiation as defined in claim 12 wherein said compound is administered to said mammal during the time period of approximately 4 days prior to radiation exposure to approximately 4 days subsequent to said lethal dose of irradiation.